

Missouri Forest Health 2004 Highlights

Weather Effects

Above average rainfall in Spring 2004 ended the 2 ½ year drought in northwestern Missouri. With the rain, came severe storms during late May and reports of hail, wind, flood, and tornado damage at many locations across the state. The wet spring was followed by the 7th coolest summer (June-July-August period) on record with above average precipitation in much of the state during July and August. Drier conditions returned in the fall, especially in northern Missouri, resulting in below normal soil moisture conditions again in the northwest corner of the state by late November.

General Disease Activity

Numerous foliar pathogens were reported across the state during the cool, wet weather of 2004. Maple, ash, and sycamore anthracnose were routinely diagnosed throughout the spring and summer. In addition, *Tubakia* leaf spot on oaks was very evident in late spring to August. On conifers, there were increases in needle disease cases, caused by *Lophodermium* and *Sphaeropsis*, as well as cedar and juniper blights caused by *Phomopsis* and *Cercospora*. Oak wilt is typically difficult to isolate in late July because of high summer temperatures, but was detected as late as September in response to the cooler weather patterns of 2004. Samples from hawthorn and *Photinia* shrubs had an abundance of leaf spots caused by *Entomosporium mespili*, which is identified based on its distinctive spore morphology.



Entomosporium mespili Leaf Spot



Conidia of *Entomosporium mespili* (UGA Ext.)

Oak Wilt

There were 18 confirmed cases of oak wilt caused by *Ceratocystis fagacearum* out of 45 samples sent to the Missouri Department of Conservation forest health diagnostic lab (similar to 18 of 34 samples confirmed in 2003). Positives for 2004 were obtained from Audrain, Bates, Boone, Callaway, Clay, Green, Harrison, Henry, Johnson, Monroe, Montgomery, St. Charles, and St.

Louis counties. The greatest number of positives were taken from pin oak (10), followed by shingle oak (3), northern red oak (3), black oak (1), and Shumard oak (1). Bacterial leaf scorch is most likely to blame for the high number of false positives obtained this growing season as diagnostic symptoms look the same as those observed for oak wilt.



Counties Positive for Oak Wilt in 2004



Oak Wilt Positives (2001-2004)

Disease Research and Surveys

Missouri forest health specialists collaborated on the baseline *Phytophthora* study conducted by USDA Forest Service, North Central Research Station in 2004. Four sites were selected from across the state. Preliminary results have yielded positives for *Phytophthora* and are awaiting identification.

Sudden Oak Death (SOD) nursery surveys were conducted by the Missouri Department of Agriculture with no SOD being identified. In addition, the University of Missouri conducted a Forest Service-sponsored survey for SOD at 32 forest sites across the state, and again no SOD was detected. These surveys will be conducted again next year.



Phytophthora sampling near Bixby, MO

Wood Borers and Oak Decline

Reports of wood borer activity and oak decline remained relatively stable compared with recent years. No large increases in wood borer activity were observed. The abundant rainfall of 2004

may have played a role in limiting wood borer activity in previously drought-stressed areas.

Oak Defoliators

Damage from defoliating insects remained at relatively low levels in most of Missouri's oak forests for a third consecutive year. One exception was noticeable leaf skeletonizer damage on shingle oaks appearing in July in some southeastern Missouri forest stands (Ste. Genevieve, Perry, and Cape Girardeau Counties).

Loblolly Pine Sawfly

The loblolly pine sawfly (*Neodiprion taedae linearis*) caused isolated pockets of severe defoliation of shortleaf pine and a few planted loblolly pines across southern Missouri in May. The widely scattered pockets consisted of one to 50 trees each. Loblolly pine sawfly populations can be extremely heavy on just a few trees, causing near complete defoliation. However, they feed primarily on previous year's foliage, usually leaving the new expanding needles. Tree mortality does not normally occur from one year's defoliation by these insects, although trees will be stressed and more vulnerable to other insects (e.g., bark beetles) and diseases. Growth loss often occurs.



Loblolly pine sawfly larva



Branches defoliated by loblolly pine sawflies

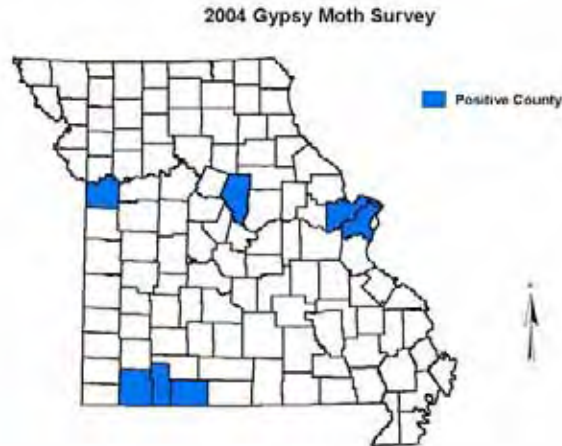
Oak Galls

The gall-forming insects that have caused noticeable damage to oaks in recent years are the horned oak gall wasp (*Callirhytis cornigera*), gouty oak gall wasp (*C. quercuspunctata*), and jumping oak gall wasp (*Neuroterus* sp.). Horned oak galls and gouty oak galls continued to be reported at high levels on pin oaks and shingle oaks in Missouri, especially in the St. Louis area. These branch galls can build up in numbers over time resulting in increasing branch dieback and tree decline. Leaf damage on white oaks from the jumping oak gall wasp was very minimal in 2004, being reported only from isolated locations around the state.

Gypsy Moth

The Missouri Cooperative Gypsy Moth Survey continued its annual effort to detect the presence of gypsy moths by placing and monitoring more than 11,800 traps throughout the state in 2004. A total of 18 moths were captured statewide. Continuing the pattern of the past several years, the highest number of moths were captured in the St. Louis area (8 moths in St. Louis County;

one moth in St. Charles County), followed by six moths captured in southwestern Missouri (Barry, Stone, and Taney Counties). Most of the latter group were taken near popular recreational areas. Additionally, two moths were caught in Kansas City (Jackson County) and one in Columbia (Boone County).



In spite of repeated moth captures in some areas, there are no known populations of gypsy moths in Missouri at this time. Sites where gypsy moths have been captured are surveyed with an increased trap density in the following year. In many cases, survey results in the vicinity of past captures have been negative within one or two years following the original capture. Despite these favorable past results, the risk of gypsy moths establishing in Missouri continues to increase as infested areas in nearby states expand. Statewide gypsy moth monitoring efforts will continue annually in Missouri.